

TWENTY-FIRST STREET BRIDGE
CITY OF ST. LOUIS, MISSOURI

HAER No. MO-11

HAER
MO,
96-SALV,
74-

PHOTOGRAPHS

HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
DEPARTMENT OF THE INTERIOR
P.O. BOX 25287
DENVER, COLORADO 80225

HISTORIC AMERICAN ENGINEERING RECORD

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Twenty-First Street Bridge

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Location: Spanning Union Pacific (formerly Missouri Pacific) and Terminal Railroad Association Tracks at Twenty-First Street between Papin Street and the U. S. Route 40 Viaduct, St. Louis, Missouri

UTM: 15.742701.4278451
Quad: Cahokia and Granite City

Date of Construction: 1890-1892

Present Owner: City of St. Louis
City Hall
St. Louis, Missouri 63103

Present Use: None, bridge was closed to vehicular and pedestrian traffic in 1976

Significance: The Twenty-First Street Bridge is a 1,272-foot-long through Parker truss and through Pony truss featuring pineapple finials atop its portals. It is a little-altered surviving example of a late 19th century steel truss bridge. Bridges of this age are rare in Missouri.

Historian: Sverdrup & Parcel and Associates, Inc.
July 1984

Transmitted by: Jean P. Yearby, HAER, 1985

The Twenty-First Street Bridge was opened to traffic in 1892. The bridge was designed by the Office of the Bridge Engineer of the city of St. Louis, under the direction of Carl Gayler, C.E. and built between 1890 and 1892, probably by Messrs. Stifel and Ruckert. In his annual report (1892) to the City Street Commissioner, the city's Bridge Engineer, Carl Gayler, noted that the cost of the bridge would total almost \$200,000, exclusive of damages paid to property owners at either end of the bridge due to grade changes. Mr. Gayler noted that the superstructure was of "mild steel, with the exception of the tie-rods and counters, which are wrought iron."

The Twenty-First Street Bridge is located at the southwest edge of the St. Louis Central District about 1,500 feet southwest of St. Louis Union Station. Until 1976, the bridge carried Twenty-First Street over the broad, shallow Mill Creek Valley and about fifteen tracks of the Terminal Railroad Association and the Union Pacific (formerly Missouri Pacific) Railroad. At one time, it provided an important north-south connection over the extensive east-west trending rail/industrial corridor that tends to divide St. Louis into north and south sectors. However, in 1976 the bridge was closed to vehicular and pedestrian traffic, because it had deteriorated (from lack of maintenance) to the point that it was unsafe. In June 1983, a 60-foot section of the bridge deck collapsed.

Due to the structural deterioration and alternative transportation and traffic plans for the area, the city of St. Louis does not intend to repair or replace the bridge.

The Twenty-First Street Bridge is a 1,272-foot-long structure consisting of three continuous pin-connected through Parker truss main spans and fourteen through Pony truss approach spans (six on the north approach and eight on the south approach). The superstructure is of steel and is supported by a substructure consisting of steel viaduct bents on masonry footings, except the abutments and one pier (#2), which are entirely of masonry construction. The through Parker truss spans consist of a 203-foot-long main span flanked by a 138-foot through truss span to the south and a 150-foot through truss span to the north. A Parker truss is similar to a Pratt truss, but is distinguished from this and other through trusses by a provision of a polygonal top chord. It was a common bridge design of the late nineteenth and early twentieth centuries, but bridges of this type are rarely designed today. It is one of the few remaining, little-altered through Parker trusses in Missouri. The entire superstructure of the main spans below deck level is encased in concrete, pneumatically applied in the early 1930s to protect the superstructure from the corrosive effects of steam engine blast. Each portal features decorative pineapple finials as well as a dateplate ("1982"). The six through Pony truss spans on the north approach are each 53 feet long; the eight through Pony truss spans on the south approach vary in length from 53 to 65 feet. Both approach roadways consist of an earth-filled, masonry retaining wall abutment structure.

The original 320-foot-wide roadway deck was a six-inch cedar block pavement that was replaced many times throughout the life of the bridge. In 1910, the deck was modified to accommodate a pair of streetcar tracks. The existing roadway deck dates from 1955, at which time the timber and asphalt deck, then in place, was replaced with a 4-1/4 inch-thick, armored, reinforced concrete slab.

There are a number of design and ornamental features of the bridge that are distinctive and no longer found in bridges designed in this day and age. Note has already been made of pin connections in the trusses; bolted or welded construction is now the rule. Second, an interesting feature of sidewalk construction, noted by James B. Decker in his 1970 inspection report, is the provision through the sidewalk for the web members of the approach Pony truss spans. Neat openings were provided in the concrete to allow potentially corrosive water and debris to pass through and not be trapped on the roadway deck. Third, the wheel-type tension adjustment devices, provided to adjust the camber of the truss are no longer found. Fourth, the ornamentation over each portal, in the form of dateplates and pineapple finials, is distinctive.

Bibliography:

City of St. Louis, Office of Bridge Engineer, Street Department, Design Drawings of the Twenty-First Street Bridge, various dates between 1890 and 1896.

City of St. Louis, Missouri, Bridge Engineer's Report, 1891-1892.

City of St. Louis, Board of Public Service Preliminary Case Report, Twenty-First Street Bridge, Papin Street to Clark Avenue, 1983.

City of St. Louis, Internal Correspondence Regarding Structure Condition of and Required Repairs to the Twenty-First Street Bridge.